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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,560	01/22/2002	Mou-Shiung Lin	MEGP0009USA	6103
27765 7590 05/21/2007 NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116			EXAMINER MITCHELL, JAMES M	
			ART UNIT 2813	PAPER NUMBER
			NOTIFICATION DATE 05/21/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	Application No. 10/055,560	Applicant(s) LIN ET AL	
	Examiner James M. Mitchell	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 2/1/2007.  
 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 242-274 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 242-246, 249-258 and 261-274 is/are rejected.  
 7) ☒ Claim(s) 247, 248, 259 and 260 is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☒ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is in response to applicant's election filed February 1, 2007.

#### ***Election/Restrictions***

2. Claims 253, 255, 265, 267, 272 and 274 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on February 1, 2007.

3. Applicant's election with traverse of Species IU, subspecies A in the reply filed on February 1, 2007 is acknowledged. The traversal is on the ground(s) that that the field of search covers all species and that it would be a financial burden on applicant. While financial burden on applicant would not be persuasive in light of a restriction made consistent with chapter 800 of the M.P.E.P, upon further consideration the species they are considered to be obvious modifications of one another; hence the species restriction is withdrawn based on the rationale within MPEP 803.02 (independent and distinct inventions are found where two or more of the members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s)). The restriction is withdrawn.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 244 and 269 are rejected under 35 U.S.C. 102(e) as being anticipated by Nuytkens et al. (U.S. 6,838,750).

6. Nuytkens (e.g. Fig.34-39) discloses:

(cl. 244) a chip packaging method comprising: providing a first die (114) having a first top surface at a horizontal level; providing a second die (116) having a second top surface at said horizontal level; depositing a passive device (146) over said horizontal level, wherein said passive device has a portion not over said first and second dies (e.g. portions that extends to the right of chip) ; and depositing a metal trace (144) over said horizontal level, wherein said metal trace extends across an edge of said first or second die (Fig. 24, 38);

(cl. 269) where in said depositing said metal trace comprises electroplating (Col. 12, Lines 10-13).

7. Claims 242-245, 249, 250, 252, 254, 256, 257, 261, 262, 264, 266, 268, 269, 271 and 273 are rejected under 35 U.S.C. 102(e) as being anticipated by Towle et al. (U.S. 2002/0074641).

8. Towle (Fig. 17, 22, 32-34) discloses:

(cl. 242) a chip packaging method comprising joining at least a die (314) having a top surface at a horizontal level to a substrate (302), after joining, depositing metallization/

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trace (120) over said horizontal level (e.g. above chip) separated by dielectric layer that form a passive device (capacitance) over the said substrate wherein said metal trace extends across an edge of said first or second die (e.g. extends to the left or right of die edge; Fig. 31), said passive device has a portion not over said die (e.g. far right of package with wiring separated by insulating layers), horizontal and separating said substrate ("singulated"; Par. 0047); with the passive over the horizontal (i.e. match where top of die is level with top of substrate); and depositing a dielectric (124) over horizontal followed by at least one trace (120); whereby said trace extends to a place under which said die does not exist (e.g. wiring connected to outermost balls extends past die); with a first end of wiring (e.g. part of passive component) connected to die and a second end connected to chip package (e.g. part of wiring connected to chip pad, 324 and other end of wiring connected to external contact point e.g. 120);

(cl. 245, 257) with the substrate comprising metal ("heat spreader...copper"; Par. 0038);

(cl. 249, 261) joining the die and said substrate (Fig. 29), depositing circuit layer extending over the die (Fig. 30) followed by separating said substrate (Fig. 22 & 30; Par. 0030);

(cl. 250, 252, 262, 264, 269, 271) wherein said depositing said metal trace comprises electroplating (Par. 0024);

(cl. 254, 273) depositing solder bumps (e.g. 258; Par. 0033) above and therefore over said substrate and over horizontal level (e.g. above chips);

(cl. 256, 268) depositing said passive (e.g. traces forming capacitance in Fig. 8) followed by separating substrate (Fig. 18);

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(cl. 266) connecting metal bump (258; Fig. 17) to second connection point (e.g. portion along trace/Line).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 273 and 274 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nuytkens et al. (U.S. 6,838,750).

11. Nuytkens discloses the elements stated in paragraph 6 of this office action and further use of solder (Col. 1, Lines 50-51) and gold bumps (Col. 7, Lines 2-3), but does not disclose the method of its order.

12. However, applicant has not disclosed that the particular claimed sequence is for a particular unobvious purpose, produces an unexpected result, or is otherwise critical. As such forming the passive device after forming the chip would have been obvious, since it has been held the order of performing process steps is prima facie obvious in the absence of new or unexpected results. Ex parte Rubin 128 USPQ (PO BdPatApp 1959), Interactive Gift Express, Inc. v. CompuServe, Inc. 256 F.3d 1323 59 USPQ2d 1401 (Fed. Cir. 2000).

13. Claims 251, 253, 263, 265, 270 and 272 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Towle et al. (U.S. 2002/0074641) in combination with Stamper et al. (U.S. 6,331,481).

14. Towle discloses the elements stated in paragraph 8 of this office action, but does not explicitly show the use of sputtering for forming its wires.

15. However, Towle discloses the same invention except that its wiring is formed by electroplated instead of sputtering. Stamper (Col. 4, Lines 46-50) shows that sputtering and electroplating form equivalent wire structure known in the art. Therefore, because these processes are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a process of sputtering for electroplating.

16. Claims 255, 267 and 274 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Towle et al. (U.S. 2002/0074641) in combination with Shoji (U.S. 2001/0013653).

17. Towle discloses the elements stated in paragraph 8 of this office action, but does not explicitly show the use of gold bumps/ balls.

18. However, Shoji (Par. 0035) teaches use of gold bumps/balls.

19. Because, the selection of gold bumps is well known in the art at the time the invention was made as evidenced by Shoji, it would have been obvious to one of ordinary skill in the art to select the claimed material since it has been held that the selection of a known material based on its suitability for its intended use supported a

prima facie obviousness determination. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See M.P.E.P 2144.07.

20. Claims 242, 243, 245, 246, 254-258 and 266-268 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S.2002/0133943).

21. Sakamoto (7A,B) discloses:

(cl. 242, 243) a chip packaging method comprising joining at least a die (52A) having a top surface at a horizontal level to a substrate (51A), depositing a portion of a passive component (52B) above and therefore over said horizontal level (e.g. above chip) wherein said passive device has a portion not over said die (e.g. far right of package with wiring separated by insulating layers), horizontal and separating said substrate (e.g. package 50 is separated from strip shown in Fig. 1, 7B & 10; "singulated"; Par. 0024, 0043, 0047, 0083).

(cont. cl. 243) passive device having a first connection point (e.g. left bump connected to 51B) electrically connected to die (e.g. by wire, 55A), and depositing a metal bump (55B) connected to a second connection point (not labeled on 52B) of said passive device (52B);

(cl. 245, 257) wherein the substrate is metal ("Cu"; Fig. 1);

(cl. 246, 258) further joining a film ("PR"; Fig. 3) and said substrate (60), an opening in said film (Fig. 3) followed by joining said die and said exposed substrate (Fig. 6);

(cl. 254, 255, 266, 267) depositing solder or gold bumps over the substrate (e.g. material under chip & passive component, 55B; Par. 0061, 0064).



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22. Sakamoto does not appear to explicitly disclose the order of when the passive device is deposited or the order of separating said substrate.

23. However, applicant has not disclosed that the particular claimed sequence is for a particular unobvious purpose, produces an unexpected result, or is otherwise critical. As such forming the passive device after forming the chip would have been obvious, since it has been held the order of performing process steps is prima facie obvious in the absence of new or unexpected results. Ex parte Rubin 128 USPQ (PO BdPatApp 1959), Interactive Gift Express, Inc. v. CompuServe, Inc. 256 F.3d 1323 59 USPQ2d 1401 (Fed. Cir. 2000).

24. Claims 242-244 under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499).

25. Tabrizi (Fig. 2, 4, 5) discloses a chip packaging method comprising joining at least a die (520) having a top surface at a horizontal level to a substrate (500), after joining, depositing metallization/ trace (560) over said horizontal level (e.g. above chip) forming a passive device over the said substrate, horizontal level (e.g. in "redistribution or additional dielectric"; Col. 5, Lines 1-4) layer, and separating said substrate ("form multiple electronic components"; Col. 1, Lines 45-46); with the passive over the horizontal (e.g./ passive in redistribution layer, 560,570); and depositing a dielectric (passivation not labeled covering pad, 540 & 550, 570) over horizontal followed by at least one trace (120); whereby said trace extends to a place under which said die does not exist (e.g. wiring connected to outermost balls, 580 that extends past die).

26. Tabrizi does not appear to explicitly disclose that a portion of the passive component is not over (e.g. understood to mean to left or right) said die.

27. However since placement of a capacitor to either the left or right of die would not modify the operation of the device and applicant has not disclosed that the placement is for any unobvious or critical reasons, the rearrangement of the capacitor would have been obvious since it has been held that the mere shifting of parts without providing modification to the device are obvious. See e.g. *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) (Claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device.); *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (the particular placement of a contact in a conductivity measuring device was held to be an obvious matter of design choice).

28. Furthermore, having a portion of a passive component not over the die is analogous to merely changing the size/ configuration of the passive component. Applicant has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result. As such, changing the size/configuration of the passive component would have been obvious to one of ordinary skill in the art, since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237

(CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

### ***Allowable Subject Matter***

29. Claims 247, 248, 259 and 260 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

30. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose attaching a metal film to substrate or punching including all the limitations of the independent claim.

### ***Response to Arguments***

31. Applicant's arguments with respect to the amendment of the claims have been considered but are moot in view of the new ground(s) of rejection. However in an effort to expedite prosecution of the application examiner has addressed some arguments that still may be relevant.

32 With respect to Sakamoto applicant contends that the prior art does not show substrate 51 separated. Examiner respectfully disagrees, because Fig. 10 clearly shows the dicing of 50 which 51 is formed of.

33. With respect to Tabrizi, applicant contends that the prior art does not anticipate the claimed invention, because it does not anticipate interference between the passive device and die can be reduced. Because the limitation is not claimed the argument is

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moot. Furthermore, the claim does not preclude a portion being over the die; thus, the alleged reduction in interference would not occur. Even assuming there was reduction in interference, this would merely be an expected result; interference is reduced the farther it is away from the chip component.

34. With respect to Towle applicant contends that examiner should evaluate the function. Examiner agrees and has been considered. However, because the prior art discloses the structure as claimed, it is capable of performing the same function as indicated above. As such, applicant has not overcome examiner's prima facie case.

### ***Conclusion***

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ex. Mitchell, J.D.  
April 29, 2007

